

In the Claims:

Please amend the claims as follows.

26. (Amended) A method of manufacturing a semiconductor device comprising:

providing a semiconductor film on an insulating surface;

providing said semiconductor film with a catalyst metal-containing material;

crystallizing said semiconductor film by heating in a way that causes said catalyst metal to diffuse through the semiconductor film and function to promote the crystallization of the semiconductor film;

forming a gettering layer comprising phosphorus over said semiconductor film after the crystallization; and

heating said semiconductor film and said gettering layer at a temperature from 500°C to 800°C in order to getter the catalyst metal in said semiconductor film using said gettering layer.

27. (Amended) A method according to claim 26 wherein said semiconductor device is a photoelectric conversion device.

34. (Amended) A method of manufacturing a semiconductor device comprising:

providing a substantially intrinsic semiconductor film on an insulating surface;

providing said semiconductor film with a catalyst metal-containing material;

crystallizing said semiconductor film by heating in a way that causes said catalyst metal to diffuse through the semiconductor film and function to promote the crystallization of said semiconductor film;

forming a gettering layer comprising phosphorus over said semiconductor film after the crystallization; and

heating said semiconductor film and said gettering layer in order to getter the catalyst metal in said semiconductor film by said gettering layer.

35. (Amended) A method according to claim 34 wherein said semiconductor device is a photoelectric conversion device.

42. (Amended) A method of manufacturing a semiconductor device comprising:

providing a semiconductor film on an insulating surface; providing a catalyst metal-containing material on said semiconductor film;

crystallizing said semiconductor film by heating in a way that causes said catalyst metal to diffuse through the

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semiconductor film and function to promote the crystallization  
of said semiconductor film;

forming a gettering layer comprising phosphorus over said  
semiconductor film after the crystallization; and

heating said semiconductor film and said gettering layer in a  
nitrogen atmosphere in order to getter the catalyst metal  
contained in said semiconductor film by said gettering layer.

43. (Amended) A method according to claim 42 wherein said  
semiconductor device is a photoelectric conversion device.

51. (Amended) A method of manufacturing a semiconductor device  
having a junction, said method comprising:

providing a semiconductor film comprising amorphous silicon  
on an insulating surface;

providing a catalyst metal-containing material on said  
semiconductor film;

crystallizing said semiconductor film by heating in a way  
that causes said metal to diffuse through the semiconductor film  
and to promote the crystallization thereof;

forming a gettering layer comprising phosphorus over said  
semiconductor film after the crystallization;

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cont'd heating said semiconductor film and said gettering layer at a temperature from 500°C to 800°C in order to getter the metal included in said semiconductor film by said gettering layer; and forming a doped semiconductor film on said semiconductor film to form a junction.

52. (Amended) A method according to claim 51 wherein said semiconductor device is a photoelectric conversion device.

59. (Amended) A method of manufacturing a semiconductor device having a junction, said method comprising:

providing a substantially intrinsic semiconductor film on an insulating surface;

providing a catalyst metal on said semiconductor film;

crystallizing said semiconductor film by heating to cause said catalyst metal to diffuse through the semiconductor film and to promote the crystallization of said semiconductor film;

forming a gettering layer comprising phosphorus over said semiconductor film after the crystallization thereof;

heating said semiconductor film and said gettering layer in order to getter the catalyst metal in said semiconductor film by said gettering layer; and

forming a junction using said intrinsic semiconductor film.

60. (Amended) A method according to claim 59 wherein said semiconductor device is a photoelectric conversion device.

67. (Amended) A method of manufacturing a semiconductor device having a junction, said method comprising:

providing a semiconductor film comprising amorphous silicon formed on an insulating surface;

providing a catalyst metal-containing material on said semiconductor film;

crystallizing said semiconductor film by heating in a way that causes said catalyst metal to diffuse through the semiconductor film and function to promote the crystallization of said semiconductor film;

forming a gettering layer comprising phosphorus over said semiconductor film after the crystallization; and

heating said semiconductor film and said gettering layer in a nitrogen atmosphere in order to getter the catalyst metal contained in said semiconductor film by said gettering layer; and

forming a junction on said semiconductor film.

68. (Amended) A method according to claim 67 wherein said semiconductor device is a photoelectric conversion device.

76. (Amended) A method of manufacturing a semiconductor device, comprising:

providing a semiconductor film on an insulating surface;

forming a catalyst metal-containing material on said semiconductor film, said catalyst being a material which facilitates crystallization of said semiconductor film, but which when present in a final product of the semiconductor device degrades operation of the semiconductor device;

crystallizing said semiconductor film by heating in a way that causes said catalyst metal-containing material to diffuse into at least a part of the semiconductor film, said catalyst metal-containing material when so diffused functioning to facilitate said crystallization;

forming a gettering layer comprising phosphorus over said semiconductor film after said crystallization; and

processing said semiconductor film and said gettering layer to remove at least one portion of said catalyst metal in said semiconductor film.

81. (Amended) A method of manufacturing a semiconductor device comprising:

providing a semiconductor film on an insulating surface;

providing said semiconductor film with a metal-containing material;

crystallizing said semiconductor film by heating in a way that causes said metal to diffuse through the semiconductor film and function to promote the crystallization of the semiconductor film;

introducing a gettering material into an entire surface of said crystallized semiconductor film;

heating said semiconductor film after introducing said gettering material at a temperature from 500°C to 800°C in order to getter the metal in said semiconductor film; and

removing at least said entire surface after gettering the metal in said semiconductor film.

82. (Amended) A method of manufacturing a semiconductor device comprising:

providing a semiconductor film doped with boron at a concentration of 0.001-0.1 atm% on an insulating surface;

providing said semiconductor film with a metal-containing material;

crystallizing said semiconductor film by heating in a way that causes said metal to diffuse through the semiconductor film and function to promote the crystallization of said semiconductor film;

forming a gettering layer comprising phosphorus over said semiconductor film after the crystallization; and

heating said semiconductor film and said gettering layer in order to getter the metal in said semiconductor film by said gettering layer.

83. (Amended) A method of manufacturing a semiconductor device comprising:

Sub H1 } providing a substantially intrinsic semiconductor film on an insulating surface;

ES } providing said semiconductor film with a metal-containing material;

Contd } crystallizing said semiconductor film by heating in a way that causes said metal to diffuse through the semiconductor film and function to promote the crystallization of said semiconductor film;

introducing a gettering material into an entire surface of the crystallized semiconductor film;

heating said semiconductor film after introducing said gettering material in order to getter the metal in said semiconductor film; and

removing at least said entire surface after gettering the metal in said semiconductor film.

84. (Amended) A method of manufacturing a semiconductor device comprising:



providing a semiconductor film doped with boron at a concentration of 0.001-0.1 atm% on an insulating surface; providing said semiconductor film with a metal-containing material;

crystallizing said semiconductor film by heating in a way that causes said metal to diffuse through the semiconductor film and function to promote the crystallization of said semiconductor film;

introducing a gettering material into an entire surface of the crystallized semiconductor film;

heating said semiconductor film after introducing said gettering material in order to getter the metal in said semiconductor film; and

removing at least said entire surface after gettering the metal in said semiconductor film.

85. (Amended) A method of manufacturing a semiconductor device comprising:

providing a semiconductor film on an insulating surface; providing a metal-containing material on said semiconductor film;

crystallizing said semiconductor film by heating in a way that causes said metal to diffuse through the semiconductor film

and function to promote the crystallization of said semiconductor film;

introducing a gettering material into an entire surface of the crystallized semiconductor film;

heating said semiconductor film in a nitrogen atmosphere after introducing said gettering material in order to getter the metal contained in said semiconductor film; and

removing at least said entire surface after gettering the metal in said semiconductor film.

86. (Amended) A method of manufacturing a semiconductor device having a junction, said method comprising:

providing a semiconductor film doped with boron at a concentration of 0.001-0.1 atm% on an insulating surface;

providing a metal on said semiconductor film;

crystallizing said semiconductor film by heating to cause said metal to diffuse through the semiconductor film and to promote the crystallization of said semiconductor film;

forming a gettering layer comprising phosphorus over said semiconductor film after the crystallization thereof;

heating said semiconductor film and said gettering layer in order to getter the metal in said semiconductor film by said gettering layer; and

forming a junction using an intrinsic semiconductor film.

87. (Amended) A method of manufacturing a semiconductor device having a junction, said method comprising:

providing a substantially intrinsic semiconductor film on an insulating surface;

providing a metal on said semiconductor film;

crystallizing said semiconductor film by heating to cause said metal to diffuse through the semiconductor film and to promote the crystallization of said semiconductor film;

introducing a gettering material into an entire surface of the crystallized semiconductor film;

heating said semiconductor film after introducing said gettering material in order to getter the metal in said semiconductor film by said phosphorus;

removing at least said entire surface after gettering the metal in said semiconductor film; and

forming a junction using a doped semiconductor film.

88. (Amended) A method of manufacturing a semiconductor device having a junction, said method comprising:

providing a semiconductor film doped with boron at a concentration of 0.001-0.1 atm% on an insulating surface;

providing a metal on said semiconductor film;

crystallizing said semiconductor film by heating to cause said metal to diffuse through the semiconductor film and to promote the crystallization of said semiconductor film;

introducing a gettering material into an entire surface of the crystallized semiconductor film;

heating said semiconductor film and said gettering material in order to getter the metal in said semiconductor film;

removing at least said entire surface after gettering the metal in said semiconductor film; and

forming a junction using an intrinsic semiconductor film.

89. (Amended) A method of manufacturing a semiconductor device comprising:

providing a semiconductor film on an insulating surface;

forming a metal-containing material on said semiconductor film, said metal being a material which facilitates crystallization of said semiconductor film, but which when present in a final product of the semiconductor device degrades operation of the semiconductor device;

crystallizing said semiconductor film by heating in a way that causes said metal-containing material to diffuse into at least a part of the semiconductor film, said metal-containing material when so diffused functioning to facilitate said crystallization;

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introducing a gettering material into an entire surface of  
the crystallized semiconductor film;

processing said semiconductor film after introducing said  
gettering material to remove at least one portion of said metal  
in said semiconductor film; and

removing at least said entire surface of the crystallized  
semiconductor film after gettering the metal in said  
semiconductor film.

97. (Amended) A method according to any one of claims 81-89  
wherein said semiconductor device is a photoelectric conversion  
device.  
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